

Mutations – pg. 307-308

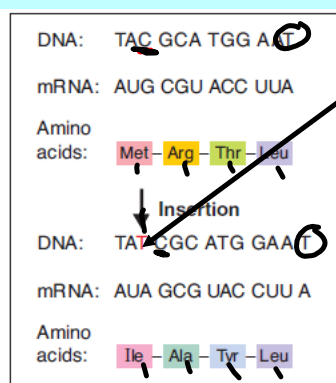
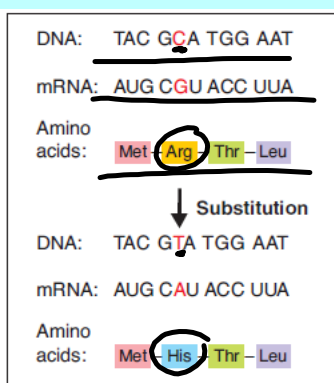
 <https://www.youtube.com/watch?v=eDbK0cxKKsk>

- **Mutations** are mistakes the cell makes when they are copying their own DNA.
- Changes in the genetic material occur during replication; such as, inserting an incorrect base or skipping a base altogether when the new strand is being put together.
- There are two groups of mutations;
- **Gene mutations**
- **Chromosomal mutations**

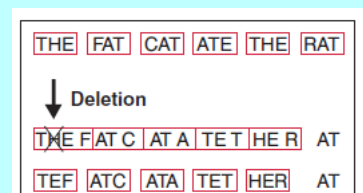
Gene Mutations

- **Gene mutations** are errors that cause changes in a single gene.
- Two kinds of gene mutations:
 - **Point mutations** involve changes in one or a few nucleotides that occur in one part of the DNA.
 - ex. Substitution is when one base is changed into another one, this effects only that one codon (amino acid).

- and type of gene mutation*
- **Frameshift mutations** shift the reading frame of the genetic message by **inserting or deleting** bases. This mutation changes every amino acid that follows the point of the mutation.

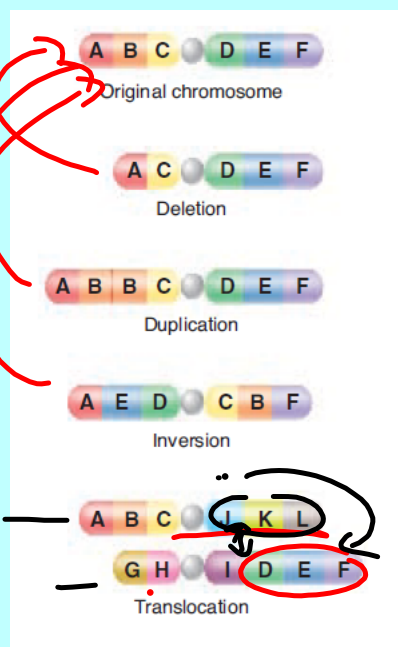


an extra base was added here, that changes the codons that follow



Chromosomal Mutations

- **Chromosomal mutations** involve changes to the number or structure of chromosomes.
- For example; change the location of a specific gene or the number of copies of some genes.
- 4 Types of Structural Chromosomal Mutations
- **Deletions** – loss of all or part of a chromosome.
- **Duplications** – extra copies of parts of a chromosome.
- **Inversions** – reverse the direction of parts of a chromosome.
- **Translocations** – part of one chromosome breaks off and attaches to another.



* Chromosomal Disorders occur when chromosomes fail to separate during cell division. We will discuss this a bit later.

Significance of Mutations

- When mutations occur the change can be beneficial, harmful or have no effect on the organism.
- **Harmful** – dramatic changes in protein structure or gene activity; such as, cancer or genetic disorders.
- **Beneficial** – production of protein with new or altered activities that can be helpful to the organism; such as new genetic variation within a species.